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In The Specification

[0005] In recent years, as the trends of the computer, commercial and consuming electronic devices are towards portable, wireless and high frequency, the amount of the electromagnetic waves emitted and leaked from these electronic devices are increased rapidly. According to a lot of results of researches, the organizations and functions of the cells of a human body may be damaged by a large amount of high frequency electromagnetic wave, and a lot of diseases, such as leukemia, brain tumor and deoxyribonucleic acid (DNA) destruction may be caused. According to some results of researches, when a human body is explored to an specific electromagnetic wave, such as that from a mobile phone, for a ~~lone~~ long time period, the functions of a main brain may be effected, such as loosing memory temporary, loosing capacity and bradykinesia. As the wireless and high frequency electronic devices are getting more popularly, anti-electromagnetic wave material, structure and device suitable for these electronic devices are more and more important.

[0011] In the first embodiment of the invention, the carbon group compound structure ~~isa~~ is a nanolevel silicon carbide particle.

[0012] Another object of the present invention is to provide a manufacturing method of a multilayer film structure for absorbing electromagnetic wave. The manufacturing method includes providing a polymer solution and adding a carbon group compound structure into the polymer solution. Then forming a plurality of polymer

~~filmsby~~ films by using the polymer solution. After forming a plurality of permeability films on each surface of the polymer films, then stacking the polymer films to obtain a multilayer film structure.

[0013] In the first embodiment of the invention, the step of forming a plurality of permeability films on each surface of the polymer films comprises a step of ~~usinga~~ using a vacuum sputtering method.

[0015] Accordingly, because of the film structure of the present invention is composed of multilayer of polymer films, and the surface of the polymer film is plated with permeability film, thus the emitted electromagnetic wave will be cancelled by the permeability film. Therefore, the electromagnetic wave in the multilayer polymer ~~filmswill~~ films will proceed to refract inside the films, and then the energy of the electromagnetic wave will be totally absorbed finally. In another case, the energy of the electromagnetic wave in the multilayer polymer films will be absorbed by the carbon group compound structure and transferred into thermal energy. Moreover, the thickness of the film structure of the present invention can be optimized according to the application on a thin-and-light electronic device.

[0027] Referring to FIG. 1 again, ~~far-infrared~~ far-infrared may also be added into the polymer films 100 for absorbing the electromagnetic wave and transferring it into a ~~far-infrared~~ far-infrared radiation. Preferably, the permeability films 104 include, for example but not limited to, a metal film, and a thickness of the metal film is in a range of 10

μm to 100 μm, in which the metal film may be composed of an alloy film or a stacking layer composed of at least one layer of the group consisted of aluminum layer, nickel layer, iron layer, copper layer or cobalt layer. When the permeability films 104 is composed of an alloy film, materials of the alloy may be at least one of the group consisted of aluminum, nickel, iron, copper, cobalt, and a trace of manganese may be added into the alloy film.

[0029] Referring to FIG. 2, providing a polymer solution in the step 200, adding a carbon group compound structure into the polymer solution in the step 202. Then forming a plurality of polymer films by using the polymer solution in the step 204. Thereafter, forming a plurality of permeability films on each surface of the polymer films in the step 206. Here, a method of forming a plurality of permeability films includes, but not limited to, a vacuum sputtering or an electroplating method. Proceeding a depositing process on each surface of the polymer films for several times in order to form a multilayer metal film may also be used as permeability films. Finally, stacking the polymer films in the step 208 by a gluing or heat pressing method. Moreover, the step 202 may further includes a step of adding a ~~far-infrared~~ far-infrared ceramic into the polymer film solution.

[0032] Referring to FIG. 3, the anti-electromagnetic wave device of the invention is applicable for absorbing the electromagnetic wave emitted from the main body 300 having a cover 302. The feature of the embodiment is that a plurality of polymer films 310 having a multi-film stacking structure are attached to an inner side of the cover 302. The polymer films 310 are composed of a carbon group compound structure 312, and a plurality of

permeability films 314 are formed on each surface of the polymer films 310.Moreover, the materials and characteristics are the same as that of the multilayer film structure for absorbing electromagnetic wave described in the first embodiment. However, the cover of the main body will be changed when the present invention is provided for various fields of applications. Therefore, the cover of the main body of the present invention is changed corresponding to the shape attached thereon and the layer number and the thickness of the polymer films 310 are dependent on the strength of the electromagnetic wave.

[0034] Referring to FIG. 4, a general mobile phone as shown includes a top cover and bottom cover 410, a screen 412, a main board 414, an antenna 416 and a keypad 418. In order to introduce the anti-electromagnetic wave effect into the mobile phone, the multilayer film structure 400 may be disposed on the surfaces of the inner side of the top cover and the bottom cover 410, and the common surface between the screen 412 and the main board 414. Moreover, to prevent leakage of the electromagnetic wave from the keypad 418, the multilayer film structure 400 may be disposed on the common surface between the keypad 418 and the main board 414, in order to cover the whole surfaces of the main board 414. Here, the keypad 418 is mounted between the main board 414 and the inner side of the top cover 410, and the keys on the keypad 418 is mounted in the openings 411 of the top cover 410. In addition, the multilayer film structure 400 may be disposed on the surface of the inner side of the top cover 410 near the antenna 416, and a part 420 of the antenna 416 can not be disposed by the multilayer film structure 400 to transmit and

receive the electromagnetic waves. In practice, the layer number of the multilayer film structure 400 used in the mobile phone described above is at least 4 layer to prevent the leakage of the electromagnetic wave, and the total thickness of the multilayer film structure 400 is in a range of, but not limited to, about 0.1 mm to about 0.2 mm. However, the example described in the embodiment shown in FIG. 4 is used for describing one of the applications of the present invention, and the multilayer film structure may be used to various of the electronic parts and devices for anti-electromagnetic wave.

[0036] Referring to FIG. 5, providing a main body having a cover in the step 500. Then forming a polymer film on an inner side of the cover in the step 504, in which the polymer films comprising a carbon group compound structure, and a ~~far-infrared~~ far-infrared ceramic may be added into the polymer before the polymer films are formed in order to transfer electromagnetic wave into ~~far-infrared~~ far-infrared radiation. Therefore, forming a permeability film on a surface of the polymer film in the step 504, in which a method of forming the permeability films includes, but not limited to, a vacuum sputtering or an electroplating method for forming an alloy layer on the surface of the polymer film. Proceeding a depositing process on each surface of the polymer films for several times to form a multilayer metal film may also be used as permeability films. Finally repeating the steps 502 and 504 to form an anti-electromagnetic wave device using the multilayer film structure.

[0037] Accordingly, because of the film structure of the present invention is composed of multilayer of polymer films, and the surface of the polymer film is plated with permeability film, thus the emitted electromagnetic wave will be cancelled by the permeability film. Therefore, the electromagnetic wave in the multilayer polymer ~~filmswill~~ films will proceed to refract inside the films, and then the energy of the electromagnetic wave will be totally absorbed finally. In another case, the energy of the electromagnetic wave in the multilayer polymer films will be absorbed by the carbon group compound structure and transferred into thermal energy. Moreover, the thickness of the film structure of the present invention can be optimized according to the application on a thin-and-light electronic device.